Docket No.: MICRON.091DV1 **Customer No. 20,995**

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Applicant	:	Terry L. Gilton, et al.
App. No.	:	09/864,605
Filed	:	May 24, 2001
For	:	SYSTEM AND METHOD FOR ANALYZING A SEMICONDUCTOR SURFACE
Examiner	:	Sylvia MacArthur
Group Art Unit	:	1763

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed is form PTO-1449 listing two (2) references that were previously cited by the Patent and Trademark Office in the prosecution of U.S. Patent Application No. 10/196,004, filed July 15, 2002, now U.S. Patent No. 6,602,795, which belongs to the same family as the above-referenced application. Copies of the references and of the Office Action in which the references were cited are enclosed.

Applicants note that there are other patent applications related to this application. U.S. Patent Application No. 10/196,004, filed July 15, 2002, now U.S. Patent No. 6,602,795, is a continuation of U.S. Patent Application No. 09/386,124, filed August 30, 1999, now U.S. Patent No. 6,420,275. U.S. Patent Application No. 09/934,726, filed August 22, 2001, now U.S. Patent No. 6,519,031, and U.S. Patent Application No. 09/864,605, filed May 24, 2001, are divisionals of U.S. Patent Application No. 09/386,124, filed August 30, 1999, now U.S. Patent No. 6,420,275. In addition, Applicants note that PCT Application No. PCTUS00/22195, filed August 14, 2000, claiming priority from U.S. Patent Application No. 09/386,124, filed August 30, 1999, now U.S. Patent No. 6,420,275, has since been abandoned.

This Information Disclosure Statement is being filed under 37 C.F.R. § 1.97(c)(2) before the mailing date of a final action and before the mailing of a Notice of Allowance. This Statement is accompanied by the fees set forth in 37 C.F.R. § 1.17(p). The

Commissioner is hereby authorized to charge any additional fees that may be required or to credit any overpayment to Account No. 11-1410.

Respectfully submitted,
KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 10/20/03

By: John R. King
John R. King
Registration No. 34,362
Attorney of Record
Customer No. 20,995
(949) 760-0404

H:\DOCS\CAF\CAF-2077.DOC
101703:cs

FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(USE SEVERAL SHEETS IF NECESSARY)

ATTY. DOCKET NO.	APPLICATION NO.
MICRON.091DV1	09/864,605
APPLICANT: Terry L. Gilton, et al.	
FILING DATE: May 24, 2001	GROUP: 1763

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE (IF APPROPRIATE)
	1	6,010,637	1/4/00	Lee, et al.			
	2	6,261,845	7/17/01	Verhaverbeke, et al.			
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
	11							
	12							
	13							
	14							
	15							
	16							

EXAMINER INITIAL		**OTHER DOCUMENTS** (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)
	17	
	18	
	19	
	20	
	21	

H:\DOCS\CAF\CAF-2076.DOC
101703

EXAMINER	DATE CONSIDERED

***EXAMINER:** INITIAL IF CITATION CONSIDERED, WHETHER OR NOT CITATION IS IN CONFORMANCE WITH MPEP 609; DRAW LINE THROUGH CITATION IF NOT IN CONFORMANCE AND NOT CONSIDERED, INCLUDE COPY OF THIS FORM WITH NEXT COMMUNICATION TO APPLICANT.

MICRON.091C1
JRK/MJ04

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/196,004	07/15/2002	Terry L. Gilton	MICRON.091C1	7820

20995 7590 11/15/2002

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
TRAN, BINH X	
ART UNIT	**PAPER NUMBER**
1765	3

DATE MAILED: 11/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-3

Office Action Summary	Application No.	Applicant(s)	
	10/196,004	GILTON ET AL.	
	Examiner	Art Unit	
	Binh X Tran	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

RECEIVED
OCT 28 2002
TC 1700

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 1 and 11, the examiner cannot find the support for the limitation "the isolated portion being greater than the selected portion".

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 8, 15, 17, 21-23, 25, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Munson et al. (US 5,783,938).

Respect to claim 8, Munson discloses a method comprising:

using a liquid to obtain a sample from an isolated portion of the electrical circuit area (read on portion of the wafer), the isolated portion being less than an entire surface of the wafer; (Fig 1, col. 3 lines 46-60);

analyzing the sample (col. 5).

The limitation of claim 15 has been discussed in previous paragraph. Respect to claim 17, Munson discloses the liquid is water (col. 5 lines 35-37). Respect to claim 20, Munson teaches suctions the liquid from the isolated portion of the wafer using a pump. Respect to claim 21, Munson teaches to transfer the liquid from the sampling apparatus (Fig 1).

Respect to claim 22, Munson discloses a method comprising:

coupling a transport system to an analyzer, wherein the transport system comprise a transfer line (27) (read on "transport tube") and a pump (28) (Fig 1, col. 4 lines 25-28);

dispensing a liquid onto the wafer (col. 3 lines 48-50);

pumping at least a portion of the liquid from the wafer with the transport system (col. 4 lines 26-28);

transporting the removed portion of the liquid to the test cell (21) for measuring (Note: the test cell (21) read on the limitation "the analyzer"), such that the liquid isolated from the pump during transportation (Fig 1);

analyzing the liquid (col. 4, col 7).

Respect to claim 23, Munson discloses the liquid extract the residues from the wafer surface (read on "dissolve a portion of the wafer with the liquid", col. 8 lines 43-

52). Respect to claim 25, Munson teaches the transport the removed portion of the liquid is through the transfer line (27) (read on "through the transport tube", col. 4 lines 25-28). Respect to claim 27, Munson teaches isolating the liquid from the transport system comprising confining the removed liquid to the transport tube (col. 4 lines 25-28, Fig 1)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munson (US 5,783,938) in view of Lee (US 6,010,637).

Munson discloses a method comprising:

selecting a portion of the electronic circuit assembly (read on "wafer);

dispensing a liquid onto the selected portion of the wafer (col. 3 lines 48-50);

confining the liquid to an isolated portion of the wafer, the isolated portion is less than an entire surface of the semiconductor wafer (Fig 1, Note: since the selected area can be interpreted a portion of the isolated area in Fig 1, the examiner will interprets that the isolated portion is greater than the selected portion);

removing at least a portion of the liquid;

analyzing the liquid (col. 5).

Munson does not explicitly disclose that the electrical circuit is the semiconductor wafer. In a semiconductor method, Lee teaches that the electronic circuit is semiconductor wafer chip such as a DRAM chip (col. 2 lines 16-22).

It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Munson in view of Lee by having a semiconductor wafer because semiconductor wafer is highly integrated and easily made.

Respect to claims 2-3, Munson teaches forming a seal (using retaining ring 15) between the wafer and the end of the tube; dispensing the liquid through a tube (See Fig 1). Respect to claims 4-5, Munson teaches the liquid extracts the residues by removing the from the surface (read on "dissolving a portion of the wafer with the liquid" and/or "removing contamination on the isolated portion of the wafer" col. 4 lines 50-54)

7. Claim 9-10, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munson in view of Sakata (US 6,265,717).

Munson fails to disclose the step of pumping (or peristalically pumping) the sample to the nebulizer. However, Munson discloses that step of analyzing the liquid can be done using ion chromatography, mass spec (col. 6 lines 30-40). In a method for analyzing the sample using mass spectrometer, Sakata teaches peristaltic pump (111) the liquid sample (112) into the nebulizer (121) (col. 4 lines 31-40). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Munson in view of Sakata by using peristaltic pump the sample into the nebulizer because Munson is not particular sample is delivered into the mass spectrometer and therefore

any technique would produce an expected result. The limitation of claim 26 has been discussed.

8. Claims 1-8, 15-17, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu et al. (US 5,271,798) in view of Shimazaki (US 5,633,172).

Sandhu discloses a method comprising:

selecting a portion of the semiconductor wafer;

dispensing a liquid onto the selected portion of the semiconductor (Fig 2, col. 2 lines 63-67);

confining the liquid to an isolated portion of the semiconductor, the isolated portion being greater than the selected portion and less than an entire surface of the semiconductor wafer (Fig 2, col.3 lines 1-27);

removing at least a portion of the liquid (col. 3 lines 29-37 or col. 3 lines 64-65).

Sandhu does not disclose the step of analyzing the liquid. In a method for analyzing an impurity on the semiconductor substrate, Shimazaki discloses the step of analyzing the droplets after removing the droplets from the substrate (col. 3 lines 64-67, col. 9 lines 45-48, read on the limitation of "analyzing the liquid").

It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Sandhu in view of Shimazaki by analyzing the liquid because it help us to calculate the concentration of level of the impurity of the measured area.

Respect to claim 2, Sandhu teaches to form a seal between the wafer and an end of a tube (col. 3 lines 25-2. Respect to claim 3, Sandhu discloses dispensing a liquid is through a tube (Fig 2). Respect to claim 4 and 6, Sandhu discloses the step of

dispensing a wet etching agent on a portion of the semiconductor wafer to remove the material on the semiconductor substrate (col. 3 lines 60-64, read on "dissolving a portion of the semiconductor wafer with the liquid" as well as the limitation of claim 6). Respect to claim 5, Sandhu teaches to remove residue (13) (col. 3 lines 4-8). Respect to claim 7, Sandhu teaches the step of etching dissolves residue (13) within the isolated portion of the semiconductor wafer (See Fig 2-3, read on "partially dissolves a substance within ... wafer"). The limitation of claims 8, 15-16 has been discussed in previous paragraph.

Respect to claims 17, Sandhu does not explicitly disclose the chemical composition of the liquid. However Sandhu clearly disclose that "the wet etching agent may comprise such etching agents such as liquid, liquid vapor, gases, etc.., known to one skilled in the art" (col. 2 lines 66-68). In a semiconductor method, Shimazaki teaches to use an etchant comprises aqueous solution of HCl and hydrogen peroxide (read on "the liquid is selected from the group consisting of water, HF and H_2O_2", col. 3 lines 45-47). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Sandhu in view of Shimazaki by using a liquid selected from the group consisting of water and H_2O_2 because Sandhu is not particular about the specific chemical composition of the liquid and therefore any known liquid etchant would produce an expected result.

Respect to claim 20, Sandhu teaches to use vacuum to remove the liquid from the isolated portion of the wafer (Fig 2, read on "suctions the liquid from the isolated portion of the wafer").

9. Claims 11-14, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu in view of Shimzaki and further in view of Verhaverbeke et al. (US 6,261,845).

Sandhu teaches a method comprising:

dispensing a etchant onto a selected portion of the semiconductor (Fig 2, col. 2 lines 63-67);

confining the etchant to an isolated portion of the semiconductor, the isolated portion being greater than the selected portion and less than an entire surface of the semiconductor wafer (Fig 2, col.3 lines 1-27);

transferring a portion of the etchant from the isolated sectionof the wafer (col. 3 lines 29-37 or col. 3 lines 64-65).

Sandhu does not disclose the step of analyzing the etchant as a function of time. In a method for analyzing an impurity on the semiconductor substrate, Shimazaki discloses the step of analyzing the etchant as a function of depth after removing the droplets from the substrate (col. 3 lines 64-67, col. 9 lines 45-48, read on the limitation of "analyzing the etchant").

It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Sandhu in view of Shimazaki by analyzing the liquid because it help us to calculate the concentration of level of the impurity of the measured area.

Shimazaki fails to disclose the step of analyzing the etchant as a function of time. However, Shimazaki clearly disclose the step of analyzing the etchant as a function of depth (col. 4 lines 25-41). In a semiconductor method, Verhaverbeke teaches that the

etch depth is function of time as well as the chemical concentration (col. 9 lines 25-50). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Sandhu and Shimazaki in view of Verhaverbeke by analyzing the etchant as a function of time because time and etch depth and time are related through a function.

Respect to claim 12, Shimazaki teaches to determine the composition of the isolated of the wafer at different depths (col. 4 lines 35-41). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Sandhu in view of Shimazaki by determine the composition at different depth because it helps us to calculate the concentration of level of the impurity of the measured area at a certain depth.

Respect to claims 13-14, Verhaverbeke clearly discloses that etch depth is a function of chemical concentration and time. Any person having ordinary skill in the art would be able to evaluate the composition (i.e., calculating the concentration) if the expose time (first time period and/or second time period) and the depth (first depth and/or second depth) are known.

Respect to claim 18, Shimazaki discloses the liquid comprise water, HCl and H_2O_2. Shimazaki and Sandhu fail to disclose the liquid comprise water, HF and H_2O_2. Verhaverbeke teaches the etchant having water hydrogen peroxide and hydrofluoric acid (col. 10 lines 40-44). Verhaverbeke further teaches that either HCl or HF can be used. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Shimazaki and Sandhu by using the solution comprise water HF

and H_2O_2 because equivalent and substitution of one for the other would produce an expected result.

Claim 19 differs from the cited reference by the specific weight ratio. Verhaverbeke teaches the concentration (read on weight ratio) is a result effective variable (col. 9 and/or Table 1 of col.1 6). The result effective variable is commonly determined by routine experiment. The process of conducting routine optimization experiments so as to produce an expected result is obvious to one of ordinary skill in the art.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munson in view of Shimazaki.

Munson fails to disclose the step of etching a portion of the wafer with the liquid. In a semiconductor method, Shimazaki teaches to etch the semiconductor wafer with an etchant such as hydrochloric acid/hydrogen peroxide (col. 3 lines 60-63). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Munson in view of Shimazaki by etching a portion of the wafer with the liquid because the etchant will enhance the ability to remove residue on the surface.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran
November 14, 2002

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Notice of References Cited	Application/Control No. 10/196,004	Applicant(s)/Patent Under Reexamination GILTON ET AL.	
	Examiner Binh X Tran	Art Unit 1765	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
✓	A	US-6,265,717 ✓	07-2001	Sakata et al.	250/289
✓	B	US-6,261,845 ✓	07-2001	Verhaverbeke et al.	436/55
✓	C	US-6,010,637 ✓	01-2000	Lee et al.	216/96
✓	D	US-5,783,938 ✓	07-1998	Munson et al.	324/71.2
✓	E	US-5,633,172 ✓	05-1997	Shimazaki, Ayako	436/177
✓	F	US-5,271,798 ✓	12-1993	Sandhu et al.	438/745
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.